

THE SOCIAL NETWORKS OF BRITISH AND INDIAN EXPATRIATE SCIENTISTS IN BOSTON

INTRODUCTION

Although scholars are now appreciating the importance of highly skilled migrants¹, to date there have been few attempts to link this body of writing with the theoretical literature on social networks. Having said this, there is an important literature on expatriate social networks and many scholars have shown that wider differences in cultural norms between a migrant group and a local population will lead to the formation of expatriate social networks and immigrant associations (Breton, 1964; Beaverstock, 2002; Saxenian, 2006; Scott, 2007).² Much less has been said though about other factors that might affect whether migrants participate in expatriate social networks and immigrant associations.

This paper analyses the individual social networks of British and Indian scientists, including their social relationships with local professionals

¹ Salt, and Findlay, 1989; Borjas, 1999; Iredale, 1999, 2001; McLaughlan and Salt, 2002; Vertovec, 2002; Findlay *et al.*, 1996; Koser and Salt, 1997; Kofman, 2000; Meyer, 2001; Beaverstock, 2002, 2004, 2005; Raghuram, 2004; Yeoh and Willis, 2005; Saxenian, 2002, 2006; Baláž and Williams, 2004; Williams and Baláž, 2005; Williams, 2006; Scott, 2006, 2007; Lerner, 2007; Chacko, 2007.

² Expatriate social networks are relations that migrants forge and maintain with expatriates from the same country of birth. Immigrant associations are organisations that provide social support for people from the same country of birth, particularly new arrivals.

and other expatriates around Boston.³ I argue that although there is a relatively large British and Indian population in Boston in the pharmaceutical and biotechnology sector, they participate very little in expatriate social networks. This is significant because the existing literature on highly skilled migrants suggests that expatriate social networks provide migrants with a competitive advantage within regional economies (Beaverstock, 2002; Saxenian, 2006).

HIGHLY SKILLED MIGRANTS

Scholars recognise the economic importance of highly skilled migrants. Saxenian (2006), for example, argues that Chinese and Indian skilled engineers have proved important actors in the success of Silicon Valley's information and communications technology (ICT) sector. She shows that the expatriate social networks of these migrants can help them “[...] quickly identify promising new market opportunities, raise capital, build management teams, and establish partnerships with specialist producers located far away” (Saxenian, 2006, pp. 4-5). She argues that these highly skilled migrants hold a competitive advantage over domestic workers because they have the necessary language, cultural and technical skills to work in the United States (U.S.) as well as in their home countries.

³ It is acknowledged that the term ‘British’ is complex, but the overriding majority of my respondents described themselves in this way with only five percent of people identifying themselves as English, Scottish, Welsh or Northern Irish when answering the question ‘How would you describe your nationality?’ 99 percent of Indian respondents identified themselves as Indian.

Beaverstock (2002) argues that the expatriate social networks of British bankers and accountants in Singapore are critical not only in their career development, but also for the prosperity of the region.

It is not clear from the literature on highly skilled migrants whether expatriate social networks are important outside of a small number of select regions. Saxenian (2006) and Beaverstock (2002), for example, emphasise the significance of expatriate social networks in Silicon Valley and Singapore, respectively. However, to what extent are their findings prevalent in other regions? Scott (2007), for instance, argues that expatriate social networks have been valuable for some groups of skilled British migrants in Paris, but relatively unimportant for others. To date, little research has been conducted on why highly skilled migrants participate in different types of social networks. Critically, there may be distinct differences both within and between migrant groups in terms of their participation in expatriate and indigenous social networks. These differences have significant bearings on a group's ability to contribute to the economic development of a region.

Definition

Highly skilled migrants have been poorly conceptualised within the theoretical literature although there have been avid attempts to clarify their meaning (Findlay and Gould, 1989; Salt, 1992; Koser and Salt, 1997; Hardill, 1998; Iredale, 1999; Mahroum, 2000; Martin, 2003; Kofman and Raghuram,

2005). Williams (2006, p. 590) is right to argue that it is problematic to create a universal definition of highly skilled migrants because migrant groups are heterogeneous and do not fit neatly under one definition. Having said this, to avoid conceptual ambiguity, as lamented by Markusen (1999), I argue *in the context of this research* that highly skilled migrants should hold the following characteristics:

1. They were born outside of the country that they are currently residing in.
2. They hold at least a university bachelor's degree, or if not formally qualified are employed in an occupation where the above qualification is normally required.
3. They have been in full-time paid or unpaid work for at least three years since their university bachelor's degree or equivalent employment.

Although many interviewees were not highly skilled migrants when they moved to the U.S. because they migrated as students or recent graduates, importantly at the time of the fieldwork all respondents were defined as highly skilled migrants following the above characteristics. The first characteristic ensures that the definition is exclusive to people born outside of the country that they are currently residing in. In the second characteristic, I

argue that highly skilled migrants should hold at least a bachelor's degree because a large number of people hold bachelor's degrees today, meaning that the amount of potential highly skilled migrants would become inflated if this was the only defining characteristic. In the third characteristic, three years of paid or unpaid full-time work is stipulated as this demonstrates a more advanced and sufficient level of experience within the scientific sector.

SOCIAL NETWORKS

Social networks are social relationships that are forged and maintained between different actors. A social network perspective can be applied at various different scales, including at a macro (e.g. between national governments), meso (e.g. between firms) and micro-level (e.g. between individual actors) (Kadushin, 2004). I wish to show that a micro-level social network perspective, which analyses the social relationships between individual actors, is a key theoretical framework for understanding the role of highly skilled migrants within regional economies. This section analyses three branches of the social networks literature: homophily, expatriate social networks and immigrant associations.

Homophily

Homophily is the argument that people tend to have significant social contact with people who hold similar social characteristics to themselves, including age, gender, class, education, ethnicity, or occupation, to name only

a few examples (Lazarsfeld and Merton, 1954; McPherson *et al.*, 2001). Beaverstock (2002) argues that British expatriates in Singapore tended to socialise with and live near to other expatriates and 'westernised' Singaporeans. "However, when it came to the practicalities of everyday expatriate home life or in specific social contexts which excluded local Singaporeans, these expatriates were disembedded from Singapore as a global city. Here, expatriates made a conscious decision to avoid Singaporeans in their home space" (Beaverstock 2002, p. 537). Waters (2007, p. 491) finds that all of her highly skilled respondents in Vancouver and Hong Kong "[...] indicated an overwhelming propensity for socializing with people from a similar background." Similarly, Kennedy (2004, p. 169) argues that "[...] friendships and leisure time depend on forging relations with others sharing similar personal profiles irrespective of nationality." Although I support the homophily argument, I also question the extent to which similarity in country of birth always leads to strong expatriate social networks. In fact, other ties such as class, gender and occupational status, for example, may prove to be more important characteristics that determine a social network.

What has not been well understood within the social sciences literature on highly skilled migrants is whether homophilous social networks are prevalent within the workplace. According to Lin (2001), the higher the

position a person holds in a firm, the stronger the homophily principle. In other words, as workers enter more senior positions, they are increasingly likely to hold social relationships with people that have similar social characteristics to themselves. However, to what extent do senior workers also have a broader social network of professional contacts than junior workers and therefore hold more homophilous relationships than highly skilled migrants working at lower positions? It is important to determine what *type* of social relationship workers hold with different actors as this will determine the strength of their social ties with other professionals.

Expatriate social networks

Scholars disagree on the extent to which highly skilled migrants forge and maintain social relationships with other expatriates from their home countries. Scott (2007), for example, argues that new British expatriate arrivals in Paris have formed strong social ties with other British expatriates either through formal organisations such as immigrant associations, or through informal gatherings in bars and cafes. Meyer (2001), on the other hand, argues that most highly skilled Colombian and South African migrants working in developed countries do not participate in expatriate social networks:

“Highly skilled expatriates do not have strong links with fellow nationals in host countries. They only know a few, do not often go to national ceremonies, do not subscribe to national newspapers and generally, do not register with associates

(NGOs) specific to their home country” (Meyer, 2001, p. 10).

Although Meyer (2001) argues that expatriate social networks are not important for most of his sample, he argues that when expatriates have been asked to participate in programmes to support their home country, they have mostly participated. It is unclear from the theoretical literature under what circumstances people participate in expatriate social networks. Meyer (2001) argues that Colombian expatriates are more likely to forge social ties with other Colombian expatriates because of the wider differences in social norms between Colombia and most developed countries. Whereas South African expatriates are less likely to form expatriate social networks because of the “[...] similarities of the educational, occupational and cultural (especially linguistic) systems” between South Africa and developed countries such as the U.S., the U.K., Canada, Australia and New Zealand where 75% of South African expatriates move (Meyer, 2001, p. 9). Meyer’s (2001) argument suggests that expatriates who hold wider differences in social norms to the host country’s population are more likely to participate in expatriate social networks than migrants that share similar social norms to the host country’s population. The inability to speak the language of the indigenous population appears to increase the likelihood of highly skilled migrants participating in expatriate social networks rather than indigenous social networks (Kennedy, 2004).

It is important to establish in what contexts migrants rely on different types of social networks. Breton (1964) suggests that wider cultural differences such as language, skin colour and religion between a migrant group and a host country will lead to greater participation by migrants in expatriate social networks. Hardwick's (2003) research shows that social networks are critical for migrant groups that originate from countries that hold very different social norms to those held in a host country. In particular, she argues that because cultural and religious norms are markedly different in Russia and Ukraine, compared to the U.S., Russian and Ukrainian migrants have forged strong social ties with other migrants from these countries, not only to help them migrate to the U.S., but also to enable them to share common "[...] religious beliefs, moral values and regular participation in church services and religious activities" with other migrants (Hardwick, 2003, p. 176). However, she also argues that it is the common cultural characteristics within a migrant group that cause people to participate in expatriate social networks. Therefore, it is unclear whether it is the differences between migrant groups and the host population, or the similarities within a migrant group which determines participation in expatriate social networks.

The literature on the settlement of highly skilled migrants argues that expatriate social networks can help these migrants start-up companies.

Saxenian (2006) demonstrates from her survey that half the foreign-born entrepreneurs in Silicon Valley in 2001 said that their company had two or more founders from the same country of birth, which supports some aspects of homophily. The shared experience of migration, the commonality of language, education, culture and history among first-generation migrants causes them to have greater trust in their fellow expatriates compared to others. This phenomenon has important implications for the dynamics of Silicon Valley as well as the global economy. Indeed, two of the most popular locations for outsourcing today are China and India. There is little doubt according to Saxenian (2006) that the Chinese and Indian professional networks in Silicon Valley have been integral in inducing economic growth in China and India. It remains unclear, however, whether highly skilled migrant groups outside of Silicon Valley are participating in expatriate social networks for the purposes of professional gain.

Some scholars argue that migrants often form social relationships with expatriates from different countries. Beaverstock (2002) shows that the social networks among the British financial elite in Singapore are not exclusively British:

“All expatriates mixed with ‘western educated/experienced’ locals and other expatriate colleagues, of all nationalities (but principally from North America, Europe, Australia and New Zealand [sic]), from other departments within the organisation, on a regular basis, with regular membership networks”

(Beaverstock, 2002, p. 532).

He argues that British expatriates socialise in the same bars and restaurants with other expatriate peers from all nationalities, but they “[...] tended to avoid contact with local Singaporeans, unless they were clients, potential clients or useful contacts” (Beaverstock, 2002, pp. 532-533). He argues that British expatriates avoided socialising with Singaporeans because they lived in very well defined expatriate enclaves such as Holland Village. In addition, “[...] because of the different social and cultural practices of the locals towards socializing around alcohol and watching sporting events (e.g. soccer, rugby, cricket), they tended to avoid the expatriate replicated City of London Friday night drinking culture in downtown Singapore” (Beaverstock, 2002, p. 534). Saxenian (2006, p. 49) argues that Chinese and Indian engineers have also formed their own social networks in Silicon Valley in a similar fashion to British workers in Singapore. However, the Chinese and Indian population in Silicon Valley formed social relationships with one another largely because they felt marginalised from mainstream American social networks:

“Feeling like outsiders to the old-boy networks created by the region's native-born engineers, the immigrant Indian and Chinese engineers organized their own social and professional networks. They found one another socially first because of shared educational and professional backgrounds, as well as common culture, language, and history. Over time they adapted the networks to professional ends, providing first-generation immigrants with access to the role

models, contacts, advice, funding, and the local market knowledge needed to identify partners and business opportunities.”

In short, the above examples illustrate that highly skilled migrants have different reasons for forming social networks with expatriates from other countries. To what extent do highly skilled migrants socialise with other expatriates because either they feel marginalised from mainstream society and therefore have greater commonality with these expatriates, or because they have different cultural norms surrounding socialising to the indigenous population and therefore live near to and socialise with expatriates from their own or other countries? Again, greater investigation is needed here.

Expatriate social networks have been extremely important for many groups, but it is vital that migrants extend their social networks into the local population as well.

“There is a growing recognition that while ethnic networks may help in creating a start-up, a new company must quickly become part of the mainstream in order to have access to talent, capital, or partners. [...] The most successful immigrant businesses in Silicon Valley today are those that draw on ethnic resources, at least initially, while integrating over time into mainstream technology and business networks (Saxenian, 2006, pp. 63-64).”

The most economically successful highly skilled migrants, according to Saxenian (2006), have been those that have avoided only participating in self-contained ethnic enclaves, but have also contributed to professional events

organised by the indigenous population. Hagan (1998) also argues that expatriate social networks are central for helping migrants settle in a new country and like Saxenian (2006) she claims that migrants must participate in more expansive social ties with non-migrants in the long-term.

“As the settlement period lengthens, however, disadvantages of immigrant-based social networks can and sometimes do emerge. Migrants can become so tightly encapsulated in social networks based on strong ties to coethnics that they lose some of the advantages associated with weak ties with residents outside the community” (Hagan, 1998, p. 65).

Williams (2006, p. 592) shows that migrants have “[...] different social networks to non-migrants, and can draw on these to access new and different sources of encultured and embedded knowledge.” Kennedy (2004, p. 164) finds that transnational migrants in the building design industry “[...] spent most of their leisure time with immediate work colleagues and/or with others related to the current company project such as clients, building contractors, suppliers and site managers” rather than expatriates per se.. This demonstrates that highly skilled migrants sometimes “[...] lack ideological loyalties or a deeply shared collective sense of emotional bonding that *precedes* their sojourn abroad” (Kennedy, 2004, p. 164; original emphasis). Often this is owing to expatriates working long hours and having little time for forging social ties outside of the firm. What is not apparent from the literature on highly skilled migrants and social networks is at what stage migrants

participate more in indigenous social networks than expatriate social networks. In addition, under what circumstances would highly skilled migrants not participate in expatriate social networks, but immediately participate in indigenous social networks?

Immigrant associations

Immigrant associations are organisations that provide social support for people from the same country of birth, particularly new arrivals. They can enable members to gain access to information about housing, employment, education, business meetings, societies and sports clubs. Saxenian (2006) shows that the Chinese and Indian groups around Silicon Valley have created large immigrant associations such as the Chinese Institute of Engineers (CIE) which boasts nine hundred members. Beaverstock (2002, p. 533) finds that British expatriates in Singapore “[...] were encouraged and paid by their companies to join business associations to tout for business, find out about the market, and any government legislation that is going to be introduced.” In short, what Saxenian (2006) and Beaverstock (2002) describe are exclusive organisations that facilitate expatriate social networks. Although people from different countries of origin are free to join these associations, few in practice do so because they have little in common in terms of social and cultural experiences. Scott (2007) documents a number of immigrant associations in Paris, but he finds that some British associations were experiencing

difficulties with membership and a number of his interviewees were reluctant to join these associations because they were pretentious and old fashioned. Although immigrant associations exist in many regions as a way of bringing people together from similar backgrounds, it is not clear how prevalent these associations are elsewhere. In particular, to what extent are immigrant associations important when cultural norms between migrant groups and the indigenous population are similar or when the expatriate population is highly heterogeneous?

The literature is unclear about whether highly skilled migrants rely upon formal immigrant associations or less formal expatriate events such as alumni meetings to gain work-related information (cf. Saxenian, 2006; Scott, 2007; Larner, 2007; Faist, 2008). Larner (2007) finds that transnational and expatriate social networks are being formalised, thus increasing the number and density of these networks. Scott (2007, p. 6) shows that young British professionals in Paris preferred to participate in informal social networks: “Whilst some of the formal VCOs were popular amongst young city-dwelling professionals – such as the professional associations – it was the 'tribal-ephemeral' spaces of French and Anglophone bars, bistros, pubs and clubs that were more important for grounding social identities”.⁴ What is not clear is why certain expatriate groups participate in formal or informal types of

⁴ Voluntary and Community Organisations (VCOs) are expatriate associations formed for professional and social purposes.

expatriate meetings. In addition, it is not well understood why highly skilled migrant groups participate in expatriate social networks.

As mentioned above, migrants who speak different languages and hold wider variations in social and cultural norms to the indigenous population (e.g. the Chinese and Indians in Silicon Valley) are more likely to participate in expatriate social networks than groups that have relatively similar social and cultural norms (e.g. the English in Australia) to the indigenous population (Breton, 1964). The formation of expatriate social networks is an important reason why some migrant groups have proved successful in working for certain businesses in the U.S. Some of the brightest migrants have: “[...] integrated themselves into local economies by creating ethnic social structures and institutions that supported professional advancement and entrepreneurial success” (Saxenian, 2006, p. 14). The Indus Entrepreneurs (TiE), for example, is an association started by Indian entrepreneurs in Silicon Valley who wanted to make it easier for future generations of Indian expatriates to start businesses. The advantage of such an association was that Indians working in Silicon Valley could share their experiences with one another, as well as more easily extend their social networks to their home countries, which has led to many transnational business collaborations.

What we do not know is if Saxenian’s (2006) analysis of immigrant

associations are part of a broader phenomenon or only specific to Silicon Valley and a small number of other regional economies. Although TiE has a Boston chapter, for example, the expatriate social network is less strong than its Silicon Valley chapter. What are the reasons therefore why some regional economies have higher densities of expatriate social networks than others? Arguably Saxenian's (2006) analysis of highly skilled migrants is by no means paradigmatic of all regions because migrants vary both within and between places in terms of their participation in immigrant associations.

METHODOLOGY

The high concentration of large global pharmaceutical and biotechnology companies around Boston made it an ideal location for analysing the expatriate social networks of British and Indian scientists. The city also holds the second largest number of venture capital funds in the U.S. In addition, Boston hosts several world-renowned universities such as Harvard University and the Massachusetts Institute of Technology (MIT). Matthiessen *et al.* (2002) argue that Boston is one of the top five university cities in the world in terms of research output. It is also considered one of the leading regions in the world for hospitals. The fact that Boston holds some of the best universities and hospitals in the world, as well as most of the leading pharmaceutical and biotechnology companies has meant that it has attracted

a large number of scientists, both nationally as well as from abroad. 28% of Boston's total population is foreign-born and over 11,500 people from the cities of Boston and Cambridge work in scientific research and development services (U.S. Census Bureau 2002).

I interviewed British- and Indian-born scientists to explore the differences between highly skilled migrant groups. I wanted to establish whether factors such as language ability or cultural background might determine participation in expatriate social networks. Breton (1964) suggests that people with similar social characteristics have a higher propensity to form social networks with other people with comparable social characteristics. The evidence that this phenomenon takes place among highly skilled migrants is inconclusive and therefore warrants further investigation. British scientists have relatively similar social characteristics to American citizens, compared to Indian scientists. As a result, a British and Indian comparative study enables an analysis of the importance of particular social factors that might influence the formation of expatriate social networks. In short, I wanted to analyse one migrant group that held relatively similar and one migrant group that held relatively different social characteristics to the indigenous population to establish whether such differences influences their participation in expatriate social networks.

I also chose migrant groups that had a similar representation of

expatriates in the Boston area, according to the U.S. Census Bureau (2000). In 2000, 2,422 British-born people and 2,618 Indian-born people were living in Boston (0.9% of the total population of the city).⁵ In spite of this small proportion, British and Indian scientists have founded more engineering and technology companies than other migrant groups in the U.S., representing approximately 33% of all companies founded by migrants (Wadhwa *et al.* (2007, p. 12). In addition, of all the engineering and technology companies in Massachusetts founded by migrants, 10% were founded by British and 10% were founded by Indian migrants (Wadhwa *et al.*, 2007, p. 17). Indian migrants are also the second highest group after China and British migrants are the fourth highest group after Canada in terms of Intellectual Property contributions in the U.S. between 1998 and 2006 (Wadhwa *et al.*, 2007, p. 25).

Structured interviews were the most important source of case study data for this research and were conducted between January and June of 2006. A total of two hundred and two British and Indian scientists were interviewed, including one hundred and one British scientists and one hundred and one Indian scientists. The average age of British respondents was 42 and the average age of Indian respondents was 39. Table 1 shows that the age distribution of British and Indian scientists was similar, but more

⁵ This figure does not include the far greater number of scientists that commute from other parts of the Boston metropolitan area. British and Indian scientists lived in a variety of places from central locations such as Boston or Cambridge to suburbs such as Lexington and Wellesley.

Indian scientists were in the 26-35 age range and more British scientists were in the 46-55 age range. 18% of my British sample and 28% of my Indian sample were women. Although gender was not a focus of this research, there were no apparent differences between men and women in terms of their participation in expatriate social networks. I define British and Indian scientists as expatriates rather than transients because they have lived in the U.S. for an average of twelve and fourteen years, respectively, and therefore are not residing in the country for short time periods.

Table 1: The age range, degree qualifications and company positions of British scientists in Boston

All British and Indian scientists held strong university degree qualifications. Table 1 shows that most British and Indian scientists held a Ph.D or an M.D. with the remaining respondents holding at least a master's or bachelor's qualification. Indian scientists held more advanced degrees than British scientists. Although the age distribution showed that the average British respondent was older than the average Indian respondent, the job titles of both groups showed a marked difference. Table 1 shows that British respondents held significantly more senior management positions, particularly in the Vice-President category, compared to Indian scientists who held significantly more Senior Scientist and Scientist positions. When taking consideration of age, British respondents still held more senior positions than

Indian scientists even though the latter held more advanced degrees.

Structured interviews were conducted with scientists from large, medium and small firms as Graph 1 illustrates.⁶ The majority of respondents worked for companies incorporated in the U.S. Approximately two-thirds of the interviews were conducted over the telephone and the other one-third were conducted face-to-face. Although face-to-face interviews typically lasted longer than telephone interviews, there was no significant difference in terms of the quality of data that respondents provided. The telephone interview was used more than the face-to-face interview because respondents preferred this type of interview given their busy work schedules. Around fifty telephone interviews, for example, needed to be rescheduled as a result of respondents having spontaneous meetings, laboratory obligations and travel commitments.

Since there was no formal register of British and Indian scientists working in pharmaceutical and biotechnology companies in Boston, gaining access to interviewees was initially through a small number of important gatekeepers. Contacts were also made through attending professional events such as conferences, workshops and networking meetings, as well as social events such as sports and social clubs. These different access avenues meant that I interviewed people from various groups within the British and Indian

⁶ I use the following categories to distinguish between different sized firms. Small firm: 0-49 employees; medium firm: 50-249 employees; large firm: 250 or more employees.

expatriate communities rather than one specific group. Further respondents were successfully contacted through snowballing. The interview questions focused on the reasons respondents immigrated to Boston, their social relationships with different individuals, their methods for obtaining new job and business information, and their anticipations of returning to the U.K. Respondents were asked both quantitative and qualitative questions in light of recent debates within economic geography surrounding methods (Markusen, 1999, 2003; Peck, 2003; Hudson, 2003). The analysis which follows focuses on the social networks of British and Indian scientists and draws upon basic statistics and qualitative data. In terms of statistics, I use some descriptive statistics such as mean, median and standard deviation, as well as some inferential statistics such as linear correlation. In terms of qualitative data, I chose quotations from respondents that are representative of British and Indian scientists unless I state otherwise. I use pseudonyms instead of the names of interviewees and I give the size and type of the company but not its name to ensure full anonymity.

ANALYSIS

Expatriate social networks

Table 2: The annual frequency that British and Indian scientists attended expatriate events

Although there are a significant number of British and Indian expatriate scientists in Boston, their expatriate social networks are weak. Table 2 shows that the median British respondent, for example, only attended a British-related networking event once a year, compared to the median Indian respondent who attended Indian-related networking events zero times in a year. Furthermore, 44% of British respondents and 61% of Indian respondents said that they did not attend any business-related networking events with people from their home country which highlights the lack of importance of British and Indian expatriate social networks for most respondents within the regional economy. As Ralph George, CEO and President of a small biotechnology company, candidly said: "I tend to avoid these types as I find them not that wholesome. There's a danger that misery leads to misery. I actively avoid networking with the Marmite brigade. I believe when in Rome do as the Romans do."

This lack of participation in expatriate social networks demonstrates that these types of social relationships are not necessarily important for highly skilled migrants in all regional economies. Kennedy (2004, pp. 174-175) found that his respondents tended not to participate in indigenous social networks owing to: "[...] the demands of the work project, the likely availability of multinational professional networks flourishing both in the company and across the locality and the sheer difficulties of getting close to older host-

nation colleagues outside the work place.” Beaverstock (2002, p. 535) argues that British expatriates in Singapore’s financial sector heavily depended upon their expatriate networks: “All expatriates agreed that the value of membership to these networks was vital for their ‘survival’ in Singapore”. Similarly, Saxenian (2006, p. 49) argues that Chinese and Indian engineers in Silicon Valley also formed expatriate social networks for professional purposes. My results show that expatriate social networks are of little importance to British and Indian scientists in Boston, but indigenous social networks were highly important in their every day lives.

Given the confidential nature of much scientific work, it is arguably not surprising that most British and Indian scientists do not participate in expatriate social networks. In addition, it is significantly more costly, time-consuming and complex to collaborate with other people in the pharmaceutical and biotechnology sector compared to other high technology sectors such as ICT. Many scientists, for example, require laboratories to conduct their research whereas IT workers can programme and write software using laptops. As a result, many scientists are more geographically restricted in where they collaborate and who they collaborate with compared to IT workers. Having said this, scholars argue that expatriate social networks are as much about forming friendships as they are about forming professional contacts and collaborations (Beaverstock, 2002; Saxenian, 2006;

Scott, 2007). Saxenian (1994) argues that the culture of a region will determine the extent that firms and individuals participate in social networks (cf. Kenney and von Burg, 1999), but it is not clear whether the culture of a region affects the degree to which highly skilled migrants participate in *expatriate* social networks.

As mentioned above, Breton (1964, p. 204) argues that if migrant groups hold very different social and cultural attributes to the local population then they will prove more likely to form immigrant associations: “The more different the people of a certain ethnicity are from the members of the native community, the easier it will be for them to develop their own institutions to satisfy their needs”. This argument would explain why British expatriates in Boston might not participate in expatriate social networks, compared to British expatriates in Singapore. Meyer (2001) supports this argument, showing that highly skilled Colombian migrants are more likely to participate in expatriate social networks than highly skilled South African migrants in developed countries because of their wider differences in social norms to the indigenous population. However, these arguments do not explain why my Indian respondents did not participate extensively in expatriate social networks.

Indian scientists found expatriate social networks even less important than British scientists, which suggest that wider differences in social and

cultural norms do not necessarily lead to greater participation in expatriate social networks. Therefore, in the context of highly skilled migrants, one aspect of homophily, the same country of birth, by no means dictates participation in expatriate social networks. As I discussed above, Breton (1964) argues that the longer a migrant remains in a receiving country, the more likely he or she is to fully participate in indigenous rather than expatriate social networks.

“It is partly true that at one time the immigrant is drawn into the ethnic subsystem, but it does not take too long before he [sic] begins to break these ties and to form new attachments outside his ethnic community. Indeed, it is after six years in the host country that the ties with the native community show a substantial increase” (Breton, 1964, p. 196).

This argument seems to hold true for this research given that the average Indian scientist has lived in the U.S. for two years longer than the average British scientist, who has a propensity to attend expatriate social events more regularly. However, since social and cultural norms are quite similar between British and American scientists, this also explains why British scientists do not participate very frequently in expatriate social networks because they prefer to integrate with the indigenous population. Nigel Wright, senior scientist at a small biotechnology company, like a large number of respondents, said that he used to attend such events quite regularly when he first arrived in the U.S. and was working in California, but now he tends to avoid them because he

feels it is more beneficial interacting with the indigenous population. In short, Breton's (1964) argument that a greater length of time spent in a host country leads to wider participation in indigenous social networks is applicable to this research. However, it remains unclear how important the principle of homophily is for determining participation in immigrant associations.

Immigrant associations

Professional and social events are organised for British and Indian scientists in Boston. The British Consulate, for example, holds a number of events around Boston under the auspices of its Science and Technology Department. However, these events are typically aimed at the elite workers in senior management positions, rather than junior scientists. Michael Lawson, Vice-President of a global strategy and consulting firm, for example, argued that he would have liked more support from the British Consulate when he first moved to Boston: "I was very disconnected with Britain. There was no social club, no outreach with the British Government. Now that I've made my name I've been involved with loads of British Consulate events, et cetera. They're trying to get British people into the U.S. I would like to have seen more of that when I was a grad student". Neil Geoffrey, CEO of a small biotechnology company, has also found the lack of British Government engagement in science in the U.S. disappointing: "I think I have had some of

my passions whittled away from me in terms of my government treatment which is a real shame from a U.K. point of view. It is about you're a Brit and you no longer feel welcomed back." Many British respondents said that they would like to have seen more participation from the British Consulate in terms of communicating with them about opportunities around Boston as well as in the U.K. Having said this, as will become apparent shortly, there was little demand for immigrant associations from most British scientists.

British Expats in Life Sciences (BELS) is the only British association in the life sciences in Boston. Although the scope of BELS encompasses British expatriate scientists in the U.S. and Canada, the majority of events are held in the Boston area. There was a strong divide between those respondents that attended BELS events regularly (10% of British respondents) and those that did not attend any British association events (90% of British respondents). Donald Gough, President of a large biotechnology company, argues that organisations such as BELS are important forums for exchanging business information: "You have something in common that creates a level of instant trust (and I have found it to be remarkably well placed) and willingness to help even if there is no explicit *quid pro quo*". Charles Thompson, scientist at a large biotechnology company, said that although he had participated in BELS events, they tended to be small compared to other migrant groups and he had not experienced other British associations in the life sciences: "There is quite a

large Chinese group, quite a large Russian group and Indians in the company. They tend to bunch together more than the British. There's always a large group of Chinese and Indians that have lunch together; maybe it's the national language thing. BELS is the only kind of organisation that I've come across". Importantly, even the respondents that did attend BELS events, did not regard them as particularly important for forging social contacts. This is in stark contrast to Beaverstock (2002), Saxenian (2006), and Scott's (2007) research, all of whom argue that immigrant associations have proved important social and professional forums for at least a sizeable proportion of their samples and in most cases the vast majority. In all three cases, though, there are differences in the first language between the migrant group and the indigenous population, unlike British scientists in Boston, which explains why the latter may not regard immigrant associations as significant.

Table 3: The percentage of British and Indian scientists who regularly attended immigrant association events

Indian scientists also had the option of attending Indian professional events. The Indus Entrepreneurs (TiE), for instance, hosts a Boston chapter which organises regular workshops, presentations, conferences and social events. The organisation is also used to build transnational relationships between high technology professionals working in Boston and India. Suman Shamba, senior scientist of a large pharmaceutical company, said that he

attended TiE events because he believed it was an excellent forum for meeting other entrepreneurs and helping him create innovative business projects. The Boston chapter of the Network of South Asian Professionals (NetSAP) is another professional association with principally Indian members. NetSAP also organises professional development events, social and cultural forums and networking opportunities.

Although both of the above immigrant associations have wide membership not just in the life sciences, but also in sectors such as ICT and finance, the vast majority of Indian respondents did not attend events. Only 8% of Indian respondents, for example, mentioned TiE or NetSAP when they were asked about their professional contact with other Indian-born scientists. This is important theoretically because it demonstrates that despite wide social and cultural differences between Indian and American scientists, Indian associations remain unimportant in the pharmaceutical and biotechnology sector. Indeed, expatriate social networks were unimportant for professional development for most Indian scientists. Similarly, Montgomery (2008, p. 87) found that her Indian and Taiwanese software engineers in Silicon Valley rarely participated in immigrant association events because they were mostly useful for entrepreneurs. I find that although my British and Indian respondents participated infrequently in expatriate social networks, they were even less likely to participate in formalised events organised by immigrant

associations around Boston.

Other scholars argue that there is a limited relationship between differences in social and cultural attributes between a migrant group and the indigenous population and participation in immigrant associations (Moya, 2005). The qualitative responses of British scientists in Boston show that there is not the demand for British associations around Boston. Chris Wilson, Chief Scientific Officer of a medium biotechnology company, argued that the bond among British expatriates is weaker compared to other migrant groups: "As a general rule, I don't think the British group are particularly nationalistic, although there have been attempts." British and Indian associations were of little importance for my respondents. This is problematic for Breton (1964) and Meyer's (2001) argument of wider differences in social norms between migrant groups and the indigenous population as well as Hardwick's (2003) argument of greater homogeneity within migrant groups increasing participation in expatriate social network events.

It is not merely cultural and social *differences between* a migrant group and the local population, or cultural and social *similarities within* a migrant group that drive expatriate social networks, but arguably both are important. Scott (2007, p. 5) argues: "[...] regardless of the identity frontiers crossed, there remains a culturally specific and most probably language-based desire amongst British migrants to bond together." However, in his research on

Britons in Paris he finds on the one hand many traditional immigrant associations are experiencing decline in membership, yet on the other hand the emergence of new immigrant associations as well as social networks that were: “[...] looser, more ephemeral and based around commercial rather than membership-based social space” (Scott, 2007, p. 18). The fact that Scott (2007) breaks down the British expatriate population sample in Paris into a ‘six-faceted typology’ highlights their heterogeneity. This difference within an expatriate population explains why expatriate social networks have varied in popularity over time and across geographic space. A large influx of British students, for example, has led to a greater density of less formalised social networks in Parisian bars, bistros and British pubs, whereas more traditional immigrant associations have largely, although by no means entirely, experienced a reduction in membership.

British and Indian scientists in Boston were heterogeneous in terms of their age, seniority within their company, length of time they have lived in the U.S. and their reasons for migrating. There was no linear correlation between the age of respondents and their participation in immigrant associations. With these two variables British and Indian scientists showed a correlation of 0.002 and 0.04 respectively. One might expect younger respondents to participate more in immigrant associations because they need greater professional support at an early stage of their careers, but my results show no

statistical indication of this trend. Most British and Indian scientists have not participated in immigrant associations because there are wide differences within their expatriate communities around Boston. Alma Deepta, for example, is a 24-year-old scientific engineer who immigrated to the U.S. in 2003. She is unlikely to have the same demands for immigrant associations as Deven Paney, a 70-year-old chief surgeon at a major hospital who immigrated to the U.S. in 1963. These kinds of differences within a migrant group will arguably lead to less demand for and participation in immigrant associations for professional purposes. In addition, since the average Indian scientist has lived in the U.S. for fourteen years, they have not only excellent spoken and written English, but are also familiar and comfortable with American business culture. Therefore, most British and Indian scientists do not participate in immigrant associations because firstly they hold quite similar professional and social norms to the indigenous population and secondly because they hold quite different social characteristics to many other British and Indian expatriates.

Table 4: The prevalence and importance of immigrant associations for British and Indian scientists

A significant number of respondents (43% of British and 41% of Indian scientists) argued that they had come across immigrant associations such as BELS and TiE in the Boston area. However, as Table 4 shows, only 16% of

British respondents and 15% of Indian respondents said that immigrant associations were important *to them* for extending their social relationships and developing their work. Peter Licence, Director of a small biotechnology company, for example, argued: "There are a lot of people here from the U.K.; you definitely make contact with these people. Where people are from is pretty irrelevant though. In my experience, it's pretty irrelevant. BELS, it's great for a social get together, but I'm not sure it helps necessarily with your networking because you don't necessarily need people from the U.K. in the same room". One of the highlights of the BELS calendar is the annual Christmas Dinner. Although most people that attend the dinner are British and working in the life sciences, the focus is more on socialising with other British people rather than socialising with other British people working in the life sciences. John Collins, Vice-President of a large pharmaceutical company, has also not found British expatriate social networks particularly productive: "I've personally got a wide array of colleagues; I do not have a national dependence. I tend to have a lot of contacts with a broad selection of nationalities. I don't know at the time whether I was busy at work and that's why I didn't go along to other BELS meetings. I guess I wasn't just interested in getting together with expats *per se*".

The above responses are in contrast to Beaverstock's (2002) research which demonstrates that most British bankers and accountants in Singapore

were not only members of social clubs, but were largely encouraged and paid to become members by their employers. In addition, these clubs were used not only for recreational purposes, but “[...] they were used extensively for entertaining global or east-Asian and local Singaporean clients, other expatriate peers, useful contacts, and work-colleague networks, and as forums for expatriates to ‘find work’, or ‘refer’ work” (Beaverstock, 2002, p. 535). The results above suggest that both a similarity within a migrant group, for example a large volume of British bankers and accountants in Singapore, as well as wider differences in cultural norms between a migrant group and the indigenous population might lead to the formation of immigrant associations and greater participation in expatriate social networks. As mentioned above, this research has found that British and Indian scientists are not only quite similar to the indigenous population, but also quite different to other scientists within their expatriate community, which leads to less demand for participating in immigrant associations.

Table 5: Comparing British samples in Boston and Singapore

Arguably British expatriate social networks are weaker in Boston compared to Singapore, even though there is a larger number and higher proportion of expatriates, because their social characteristics are more diverse. To give one example, my British sample in Boston ranged in age from 64 to 26 with the mean being 42 and the standard deviation being 7.8. Whereas

Beaverstock's (2002, p. 529) sample in Singapore, ranged in age from 47 to 26 with the mean being 37 and the standard deviation being 5.6⁷ (see Table 5). This suggests that British expatriates in Boston have less of a shared common purpose with fellow expatriates because of their wider spread of ages. As a result of British expatriates holding more similar social characteristics in Singapore than Boston, this creates a greater demand for immigrant associations in Singapore under the homophily argument.

This research demonstrates that many British and Indian expatriate scientists are strongly embedded within local indigenous social relationships with people from the U.S., but largely disembedded from British and Indian expatriate professional ties. In spite of 2,422 British-born people and 2,618 Indian-born people living in Boston in 2000 (0.9% of the total population), for example, their expatriate social networks remain weak (U.S. Census Bureau, 2000b). This is in stark contrast to Silicon Valley where approximately 4,975 Taiwanese-born people live (0.4% of the total population) (U.S. Census Bureau, 2000b)⁸ and Singapore where there are an estimated 6,000 British expatriates (0.2% of the total population) (Yeoh and Khoo, 1998) and yet active expatriate social networks exist in these two cases. In short, the size and proportion of an expatriate population compared to the total population

⁷ When Beaverstock (2002, p. 529) categorised respondents' ages as '30s' or '40s', an age of 35 and 45, respectively, was allocated.

⁸ U.S. Census data from the cities of Cupertino, Fremont, San Jose, Saratoga and Sunnyvale were used for these figures. No data was available from the U.S. Census (2000) for the other cities in Silicon Valley.

does not necessarily lead to an active expatriate social network.

My results suggest that a larger expatriate population, although significant in some regions, does not necessarily always increase the propensity of that population to participate in expatriate social networks (see Diagram 1). However, this is unlikely to be generalisable to all migrant groups, regions and sectors. Most British and Indian respondents said they exchange important business information and socialise predominantly with American citizens. This is important because it is not clear theoretically whether participation in expatriate social networks may advantage or disadvantage certain migrant groups in terms of access to professional contacts and business information, as well as promotion within the workplace.

This research demonstrates that many British and Indian respondents exchange important business information and socialise predominantly with American citizens. There was no significant difference between British and Indian scientists in terms of their participation in expatriate social networks, despite the majority of both groups migrating to the U.S. for different reasons. Beaverstock (2002) and Saxenian's (2006) samples both participated heavily in expatriate social networks even though their samples moved to Singapore and the U.S., respectively, for different reasons. Therefore, it is problematic to argue that people migrating to another country for professional reasons such

as an internal company transfer, should participate any more or less in expatriate social networks than migrants who move to another country for educational or family purposes.

I argue that there are six reasons why expatriate scientists do not participate in expatriate social networks (see Diagram 1). First, when people participate less in indigenous social networks. Second, when people have lived in a region for a shorter length of time. Third, when the size of an expatriate population is larger. Fourth, when an expatriate population is relatively homogenous. Fifth, when an expatriate population holds very different cultural norms to the indigenous population. Sixth, when a large annual flow of expatriates from the same country move to a region. All these reasons would explain why British scientists do not participate in expatriate social networks around Boston. Similarly, with the exception of holding different cultural norms to the indigenous population, the remainder of the factors indicate why Indian scientists also do not participate in expatriate social networks.

Diagram 1: Factors that influence participation in expatriate social networks

CONCLUSIONS

Although some geographers have incorporated social networks within their analyses of highly skilled migrants (Beaverstock, 2002; Saxenian, 2006;

Scott, 2007), there continues to be a lack of engagement with theory on social networks. Through a micro-level social network perspective, this paper has demonstrated that British and Indian scientists in Boston do not rely on expatriate social networks to the extent that scholars suggest in other regional economies. Instead, it is their social relationships with the indigenous population that is more important for their professional development.

British and Indian associations are low in demand in the Boston area. Although BELS was initiated for British expatriate scientists and TiE and NetSAP for Indian expatriate scientists, professional events have not been particularly well supported. In contrast, Beaverstock (2002) argues that British expatriates in Singapore have joined a range of social clubs, including the British Club, to meet other 'western' expatriates. Similarly, Saxenian (2006) identifies a number of large immigrant associations in Silicon Valley, namely the Chinese Institute of Engineers (CIE/USA) and the Silicon Valley Indian Professionals Association (SIPA), both of which have over a thousand members.

This research has found little demand for British and Indian associations, whether they are related to science or not, in the Boston area. Most British and Indian respondents focused their professional and recreational social networks around the host population. Having said this, a number of respondents said that they would like to have received more

institutional support from the British Consulate in Boston and the Indian Embassy in New York when they first arrived in the U.S. This suggests that expatriate social networks are particularly important when migrants first arrive in a host country, an argument that Saxenian (2006) emphasises.

To date, British and Indian scientists have yet to participate extensively in expatriate social networks mainly because they have not needed them in the past to help them integrate into the local society. Although British and Indian expatriate social networks are weak in the pharmaceutical and biotechnology sector around Boston, arguably such networks might help both groups forge additional ties with important actors in Boston and abroad. Saxenian (2006), for example, has argued that highly skilled expatriate social networks around Silicon Valley have transformed the opportunities of many Chinese and Indian migrants from a position of strategic disadvantage to one of competitive advantage.

I am in agreement to a certain extent with Breton (1964) that wider differences in cultural norms between a migrant group and the indigenous population is an important determining factor in the formation of expatriate social networks including immigrant associations. However, this consideration alone is not sufficient for understanding why highly skilled migrants participate in expatriate social networks. The empirical findings of Beaverstock (2002), Saxenian (2006) and Scott (2007) would all support

Breton's (1964) argument. I would go one step further and suggest that the extent to which migrants participate in expatriate social networks also depends upon the degree of homogenisation within a migrant group, the size of an expatriate group, the annual inflow of migrants from the same country of birth, the length of time an expatriate group has lived in a host country and the propensity of an expatriate group to participate in indigenous social networks.

A micro-level social network perspective is important for highlighting the different social relationships that highly skilled migrants forge and maintain with other professionals. This research demonstrates that particular social ties such as expatriate social networks, although potentially important, are not always harnessed.

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Table 1: The age range, degree qualifications and company positions of British and Indian scientists in Boston

Age range (%)	26-35	36-45	46-55	56+
British	24	47	25	4
Indian	33	51	14	2
Highest degree (%)	Bachelor's	Master's	Doctorate or equivalent	
British	15	13	72	
Indian	7	16	77	
Company position (%)	CEO or President	Vice-President or Director	Manager or senior scientist	Researcher or scientist
British	10	50	19	21
Indian	7	22	35	36

Table 2: The annual frequency that British and Indian scientists attended expatriate events

	British scientists	Indian scientists
Mean	2/year	2/year
Median	1/year	0/year

Table 3: The percentage of British and Indian scientists who regularly attended immigrant association events

British scientists who regularly attended BELS events	10%
Indian scientists who regularly attended TiE or NetSAP events	8%

Table 4: The prevalence and importance of immigrant associations for British and Indian scientists

	British scientists	Indian scientists
Have respondents come across immigrant associations around Boston?	Yes (43%)	Yes (41%)
Do respondents find immigrant associations important professionally or socially?	Yes (16%)	Yes (15%)

Table 5: Comparing British samples in Boston and Singapore

	My fieldwork	Beaverstock (2002)
Age range of British sample	64-26	47-26
Mean age of British sample	42	37
Standard deviation	7.8	5.6